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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/229,849	01/13/1999	MARTIN SERRANO	07470/30001	5312

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EXAMINER

FLEURANTIN, JEAN B

ART UNIT	PAPER NUMBER
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2172

DATE MAILED: 08/27/2003

24

Please find below and/or attached an Office communication concerning this application or proceeding.

24

Office Action Summary

Application No.

09/229,849

Applicant(s)

SERRANO, MARTIN

Examiner

Jean B Fleurantin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06/05/03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-11,13-20 and 22-27 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

- 5) ☐ Claim(s) _____ is/are allowed.

- 6) ☒ Claim(s) 1-2, 8-11, 17-20 and 26-27 is/are rejected.

- 7) ☒ Claim(s) 4-7,13-16 and 22-25 is/are objected to.

- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

DETAILED ACTION

Response to Amendment

1. Claims 1-2, 4-11, 13-20 and 22-27 are remained pending for examination.

Response to Applicant' Remarks

2. Applicant's arguments filed on 10/23/2002 with respect to claims 1-2, 4-11, 13-20 and 22-27 are fully considered but they are not persuasive.

In response to applicant's argument on page 9, that Nothing in Iwasawa teaches or suggests a way of solving the completely different problem of "parsing a script into statements, constructing a serial dataflow graph from the parsed statements, and constructing a parallel dataflow graph from the serial dataflow graph." It is respectfully submitted that the Iwasawa reference discloses the claimed limitations as follow: a method for producing a parallel computation specification based on such analysis (thus, detect the possibility of parallel execution of each statement inside a loop; which is readable as producing a parallel computation)(see col. 2, lines 4-5);

(b) constructing a serial dataflow graph from the parsed statements (thus, flow dependence exists from $A(I+1, J)$ on the left side of 19 to $A(I, J)$ on the right side of twenty since dependence relating to C among them is loop independent, flow dependence on A is detected by the processing seventy in figure seven the processing seventy one calculates from these loop carried dependence iterated twice that multiplicity is one and this value is stored in the field twenty four of the loop table of figure five, the multiplicity 'one' means that execution is

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equivalent to the serial execution; which readable as serial dataflow graph from the parsed statements)(see col. 6, lines 40-49);

c) constructing a parallel dataflow graph from the serial dataflow graph (thus, the processing seventy two in figure seven estimates the dynamic number of executed instruction of DO 10I loop per each iteration, the statement seventeen becomes one the statement nineteen is hundred by multiplying the textural number of instruction one by the loop length hundred and the statement twenty is hundred by multiplying one by the loop length hundred, the sum of them two hundred one is stored in the fields twenty five and twenty six and the product of this value two hundred one by the loop length ten of the outer loop ten is stored in the field twenty three, since synchronization is necessary whenever I is incremented by one from the data dependence relation the processing seventy four stores the dynamic number of executed instructions per each iteration of the loop I in the field twenty seven; which is readable as constructing a parallel dataflow graph from the serial dataflow graph)(see col. 6, lines 40-62). But, Iwasawa does not explicitly indicate an application program based on a script of a script-driven software tool, comprising automatically analyzing the script, and where such parallel computation specification provides functional equivalence to the script when executed by a parallel runtime system; and plus a fragment set based on such analysis, where such parallel computation specification and script fragment set, and parsing the script into statement. However, Iwasawa implicitly indicates a compiler for generating an object code consisting of instruction columns for executing in parallel from a source program on a multi-processor consisting of processors that operates in parallel with one another, (see col. 1, lines 59-62). Further, in column 5, lines 60-67, Iwasawa teaches receiving this intermediate language six as the input middle process fourteen makes

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optimization and parallelization to modify the intermediate language six, code generation fifteen generates an object code twelve to be executed in parallel from the intermediate language six modified by the middle process. Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of Iwasawa with the script when executed by a parallel runtime system; and a fragment set based on such analysis, where such parallel computation specification and script fragment set, and parsing the script into statement. This modification would allow the teachings of Iwasawa to improve the efficiency of the parallelization applications of script-driven tools, and provide a parallelization compile method and system which can generate efficient object codes without taking fine characteristics of hardwares into specific consideration even when coding is made afresh, (see col. 1, lines 55-58).

Although the claims are interpreted in light of the specification, the limitations from the specification are not read into the claims. See *In re Van Genus*, 988 F.D 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant admits on page 9, that Iwasawa reference discloses the claimed limitations, see col. 6, lines 41-49.

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Claim Rejections - 35 U.S.C. § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 8-11, 17-20 and 26-27 are rejected under 35 U.S. C. 103 (a) as being unpatentable over US Patent No. 5,151,991 issued to Iwasawa et al. ("Iwasawa").

As per claims 1-2, 10-11 and 19-20, Iwasawa teaches a method for producing a parallel computation specification based on such analysis (thus, detect the possibility of parallel execution of each statement inside a loop; which is readable as producing a parallel computation)(see col. 2, lines 4-5);

(b) constructing a serial dataflow graph from the parsed statements (thus, flow dependence exists from A(I+1, J) on the left side of 19 to A(I, J) on the right side of twenty since dependence relating to C among them is loop independent, flow dependence on A is detected by the processing seventy in figure seven the processing seventy one calculates from these loop carried dependence iterated twice that multiplicity is one and this value is stored in the field twenty four of the loop table of figure five, the multiplicity 'one' means that execution is equivalent to the serial execution; which readable as serial dataflow graph from the parsed statements)(see col. 6, lines 40-49);

c) constructing a parallel dataflow graph from the serial dataflow graph (thus, the processing seventy two in figure seven estimates the dynamic number of executed instruction of DO 10I loop per each iteration, the statement seventeen becomes one the statement nineteen is hundred by multiplying the textual number of instruction one by the loop length hundred and the statement twenty is hundred by multiplying one by the loop length hundred, the sum of them two hundred one is stored in the fields twenty five and twenty six and the product of this value two hundred one by the loop length ten of the outer loop ten is stored in the field twenty three, since synchronization is necessary whenever I is incremented by one from the data dependence relation the processing seventy four stores the dynamic number of executed instructions per each iteration of the loop I in the field twenty seven; which is readable as constructing a parallel dataflow graph from the serial dataflow graph)(see col. 6, lines 40-62). But, Iwasawa does not explicitly indicate an application program based on a script of a script-driven software tool, comprising automatically analyzing the script, and where such parallel computation specification provides functional equivalence to the script when executed by a parallel runtime system; and plus a fragment set based on such analysis, where such parallel computation specification and script fragment set, and parsing the script into statement. However, Iwasawa implicitly indicates a compiler for generating an object code consisting of instruction columns for executing in parallel from a source program on a multi-processor consisting of processors that operates in parallel with one another, (see col. 1, lines 59-62). Further, in column 5, lines 60-67, Iwasawa teaches receiving this intermediate language six as the input middle process fourteen makes optimization and parallelization to modify the intermediate language six, code generation fifteen generates an object code twelve to be executed in parallel from the intermediate language six

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modified by the middle process. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the teachings of Iwasawa with the script when executed by a parallel runtime system; and a fragment set based on such analysis, where such parallel computation specification and script fragment set, and parsing the script into statement. This modification would allow the teachings of Iwasawa to improve the efficiency of the parallelization applications of script-driven tools, and provide a parallelization compile method and system which can generate efficient object codes without taking fine characteristics of hardwares into specific consideration even when coding is made afresh, (see col. 1, lines 55-58).

As per claims 8, 17 and 26, the limitations of claims 8, 17 and 26 are rejected in the analysis of claim 1, and these claims are rejected on that basis.

As per claims 9, 18 and 27, Iwasawa teaches a method as claimed, where producing the parallel computation specification includes applying at least one pre-defined parallelization in rewrite algorithm selected from the group comprising simple partitioning (thus, since two statements exist inside the loop in this example the program is divided into two and the items that will affect the speed-up that is the acceleration ratio, when they are executed in parallel by different processors are calculated and stored in the table for each loop; which is readable as where producing the parallel computation specification includes applying at least one pre-defined parallelization in rewrite algorithm selected from the group comprising simple partitioning)(see col. 3, lines 26-35), key-based partitioning, local-global division, external parallelism algorithm, and statement decomposition (thus, the proportion 'ration' of the number of instruction necessary for executing in parallel for each iteration of loop to the total number of instructions is calculated, the possibility of parallel execution for each statement is detected the

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statement one and two are divided by the inner loop and the possibility of their parallel execution is detected; which is readable as local-global division, external parallelism algorithm, and statement decomposition)(see col. 3, lines 1-24).

Allowable Subject Matter

4. Claims 4-7, 13-16 and 22-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

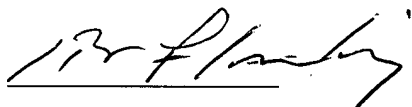
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Conclusion

6. Any inquiry concerning this communication from examiner should be directed to Jean Bolte Fleurantin at (703) 308-6718. The examiner can normally be reached on Monday through Friday from 7:30 A.M. to 6:00 P.M.

If any attempt to reach the examiner by telephone is unsuccessful, the examiner's supervisor, Mrs. KIM VU can be reached at (703) 305-8449. The FAX phone numbers for the Group 2100 Customer Service Center are: ***After Final*** (703) 746-7238, ***Official*** (703) 746-7239, and ***Non-Official*** (703) 746-7240. NOTE: Documents transmitted by facsimile will be entered as official documents on the file wrapper unless clearly marked "***DRAFT***".

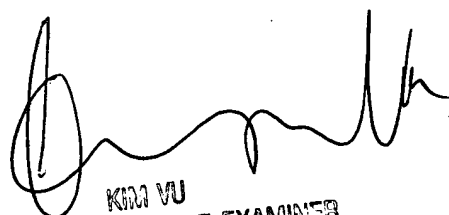
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 2100 Customer Service Center receptionist whose telephone numbers are (703) 306-5631, (703) 306-5632, (703) 306-5633.



Jean Bolte Fleurantin

August 20, 2003

JBF/



KIM VU
PATENT EXAMINER
CENTER 2100